

WHAT IS CLAIMED IS:

1. A method comprising:  
acquiring a first plurality of images of a first portion of a body  
5 undergoing substantially periodic motion;  
acquiring a second plurality of images of a second portion of the  
body, the second portion comprising a portion of the first portion;  
determining a correlation between at least one of the first plurality of  
images and at least one of the second plurality of images; and  
10 generating a combined image of the first portion and the second  
portion based on the at least one of the first plurality of images and the at  
least one of the second plurality of images, the combined image  
corresponding to a first phase of the periodic motion.
- 15 2. A method according to Claim 1, wherein the first plurality of  
images and the second plurality of images comprise three-dimensional  
cross-sectional images of the body.
- 20 3. A method according to Claim 2, wherein the first plurality of  
images and the second plurality of images are acquired by a computed  
tomography scanner.
- 25 4. A method according to Claim 2, wherein the first plurality of  
images and the second plurality of images are acquired using a linear  
accelerator.
5. A method according to Claim 1, wherein determining the  
correlation comprises:  
determining that the at least one of the first plurality of images and  
30 the at least one of the second plurality of images represent substantially a  
same phase of the periodic motion.

6. A method according to Claim 5, wherein determining the correlation further comprises:

5 determining that the portion is substantially identically represented in the at least one of the first plurality of images and the at least one of the second plurality of images.

7. A method according to Claim 1, further comprising:

10 determining a second correlation between a second at least one of the first plurality of images and a second at least one of the second plurality of images; and

15 generating a second combined image of the first portion and the second portion based on the second at least one of the first plurality of images and the second at least one of the second plurality of images, the second combined image corresponding to a second phase of the periodic motion.

8. A method according to Claim 7, further comprising:

20 generating an animation based on the combined image and on the second combined image, the animation representing the first portion and the second portion undergoing the periodic motion.

9. A method according to Claim 7, wherein determining the second correlation comprises:

25 determining that the portion is substantially identically represented in the second at least one of the first plurality of images and the second at least one of the second plurality of images.

10. A method according to Claim 1, further comprising:

30 acquiring a third plurality of images of a third portion of the body, the third portion comprising a next portion of the second portion;

determining a correlation between the at least one of the second plurality of images and at least one of the third plurality of images; and

generating a combined image of the second portion and the third portion based on the at least one of the second plurality of images and the at least one of the third plurality of images, the combined image of the second portion and the third portion corresponding to the first phase of the periodic motion.

11. A method according to Claim 10, further comprising:  
generating a next combined image based on the combined image of the second portion and the third portion and on the combined image of the first portion and the second portion, the next combined image corresponding to the first phase of the periodic motion.

12. A method according to Claim 10, wherein determining the correlation between the at least one of the second plurality of images and the at least one of the third plurality of images comprises:  
determining that the next portion is substantially identically represented in the at least one of the second plurality of images and the at least one of the third plurality of images.

13. A method according to Claim 1, further comprising:  
acquiring a third plurality of images of a third portion of the body, the third portion comprising a next portion of the second portion;  
determining a correlation between a second at least one of the second plurality of images and at least one of the third plurality of images;  
and  
generating a combined image of the second portion and the third portion based on the second at least one of the second plurality of images and the at least one of the third plurality of images, the combined image of the second portion and the third portion corresponding to a second phase of the periodic motion.

14. A method according to Claim 13, wherein determining the correlation between the second at least one of the second plurality of images and the at least one of the third plurality of images comprises:  
determining that the next portion is substantially identically  
5 represented in the at least one of the second plurality of images and the at least one of the third plurality of images.

15. An apparatus comprising:  
a memory storing processor-executable process steps; and  
10 a processor in communication with the memory and operative in conjunction with the stored process steps to:  
acquire a first plurality of images of a first portion of a body undergoing substantially periodic motion;  
acquire a second plurality of images of a second portion of the body,  
15 the second portion comprising a portion of the first portion;  
determine a correlation between at least one of the first plurality of images and at least one of the second plurality of images; and  
generate a combined image of the first portion and the second portion based on the at least one of the first plurality of images and the at  
20 least one of the second plurality of images, the combined image corresponding to a first phase of the periodic motion.

16. An apparatus according to Claim 15, wherein the first plurality of images and the second plurality of images comprise three-dimensional  
25 cross-sectional images of the body.

17. An apparatus according to Claim 16, wherein the first plurality of images and the second plurality of images are acquired by a computed tomography scanner.  
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18. An apparatus according to Claim 16, wherein the first plurality of images and the second plurality of images are acquired using a linear accelerator.

5           19. An apparatus according to Claim 15, wherein determination of the correlation comprises:

            determination that the at least one of the first plurality of images and the at least one of the second plurality of images represent substantially a same phase of the periodic motion.

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            20. An apparatus according to Claim 19, wherein determination of the correlation comprises:

            determination that the portion is substantially identically represented in the at least one of the first plurality of images and the at least one of the  
15           second plurality of images.

            21. An apparatus according to Claim 15, the processor further operative in conjunction with the stored process steps to:

            20           determine a correlation between a second at least one of the first plurality of images and a second at least one of the second plurality of images; and

            25           generate a second combined image of the first portion and the second portion based on the second at least one of the first plurality of images and the second at least one of the second plurality of images, the second combined image corresponding to a second phase of the periodic motion.

            22. An apparatus according to Claim 21, the processor further operative in conjunction with the stored process steps to:

30           generate an animation based on the combined image and on the second combined image, the animation representing the first portion and the second portion undergoing the periodic motion.

23. An apparatus according to Claim 21, wherein determination of the second correlation comprises:

5 determination that the portion is substantially identically represented in the second at least one of the first plurality of images and the second at least one of the second plurality of images.

24. An apparatus according to Claim 15, the processor further operative in conjunction with the stored process steps to:

10 acquire a third plurality of images of a third portion of the body, the third portion comprising a next portion of the second portion;

determine a correlation between the at least one of the second plurality of images and at least one of the third plurality of images; and

15 generate a combined image of the second portion and the third portion based on the at least one of the second plurality of images and the at least one of the third plurality of images, the combined image of the second portion and the third portion corresponding to the first phase of the periodic motion.

20 25. An apparatus according to Claim 24, the processor further operative in conjunction with the stored process steps to:

25 generate a next combined image based on the combined image of the second portion and the third portion and on the combined image of the first portion and the second portion, the next combined image corresponding to the first phase of the periodic motion.

26. An apparatus according to Claim 24, wherein determination of the correlation between the at least one of the second plurality of images and at least one of the third plurality of images comprises:

30 determination that the next portion is substantially identically represented in the at least one of the second plurality of images and the at least one of the third plurality of images.

27. An apparatus according to Claim 15, the processor further operative in conjunction with the stored process steps to:
- 5       acquire a third plurality of images of a third portion of the body, the third portion comprising a next portion of the second portion;
- determine a correlation between a second at least one of the second plurality of images and at least one of the third plurality of images; and
- 10       generate a combined image of the second portion and the third portion based on the second at least one of the second plurality of images and the at least one of the third plurality of images, the combined image of the second portion and the third portion corresponding to a second phase of the periodic motion.
- 15       28. An apparatus according to Claim 27, wherein determination of the correlation between the second at least one of the second plurality of images and the at least one of the third plurality of images comprises:
- determination that the next portion is substantially identically represented in the at least one of the second plurality of images and the at
- 20       least one of the third plurality of images.